

3M Dual Lock™ Industrial Fasteners

Technical Data

February, 1996

Type 250 Stem Pattern (Self-Engaging)	Clear Products:
	SJ-3460: Clear, Plainbacked (no adhesive) SJ-3560: With Clear, 3M™ VHB™ acrylic adhesive system
	Black Products:
	SJ-3440: Plainbacked (no adhesive) SJ-3540: With synthetic rubber adhesive system SJ-3550: With 3M VHB acrylic adhesive system

General Description Dual Lock Industrial Fasteners consist of continuous strips of plastic backing, with plastic mushroom shaped stems protruding up from the backing strip. When two pieces of Dual Lock fasteners are pressed together, the mushroom heads interlock with one another, with an audible snap. To open, simply pull apart. This provides fast, secure reclosable fastening performance for a wide range of applications. Cycle life exceeds 1000 reclosures.

Dual Lock Industrial Fasteners can replace conventional fasteners such as screws, clips, rivets, snaps and bolts in many applications. Plainbacked Dual Lock Fasteners are sewn or stapled in place. Other Dual Lock Fasteners are supplied with an adhesive backing for cost-effective installation on many substrates. Simply peel off the liner and press in place.

Key Features	<ul style="list-style-type: none"> • Interlocking mushroom heads for fast, cost-effective reclosable fastening • Self-engaging Type 250 stem pattern: Only one product to purchase and inventory • High performance 3M VHB acrylic adhesive systems on SJ-3550 and SJ-3560 Fasteners • Clear product for color compatibility (SJ-3460 and SJ-3560 Fasteners) • U.V. resistance • Plasticizer resistant adhesive attachment to many flexible vinyls with SJ-3550 and SJ-3560 Fasteners
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Application Idea Dual Lock Industrial Fasteners have been used extensively in transportation, electronics, business equipment, machinery, medical, and sign & display markets, as well as other markets. Dual Lock Fasteners can replace conventional mechanical fasteners in a wide range of reclosable assembly and attachment applications.

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Typical Physical Properties	Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.				
	SJ-3460	SJ-3560	SJ-3440	SJ-3540	SJ-3550
Materials:	Fastener: polyolefin	polyolefin	polyolefin	polyolefin	polyolefin
	Adhesive: none	VHB™ acrylic	none	synthetic rubber	VHB™ acrylic
	Liner: none	red polyolefin	none	white polyolefin	green polyolefin
Width, inches (mm):	1/2 (13) 1 (25) 2 (51) 4 (102)	1/2 (13) 1 (25) 2 (51) 4 (102)	1/2 (13) 1 (25) 2 (51) 4 (102)	1/2 (13) 1 (25) 2 (51) 4 (102)	1/2 (13) 1 (25) 2 (51) 4 (102)
Color:	clear	clear	black	black	black
Weight, grams/1" x 1" (grams/25 mm x 25 mm)	0.5	1.1	0.5	0.7	0.9
Engaged Thickness, inches (mm): (mated to itself)	0.16 (4.1)	0.23 (5.8)	0.16 (4.1)	0.23 (5.8)	0.23 (5.8)
Cycle Life (engaged to itself):	1000+	1000+	1000+	1000+	1000+
U.V. Resistance (ASTM D2565): (Xenon arc weatherometer)	1000 hrs	1000 hrs	1000 hrs	not rated	1000 hrs
Plasticizer Resistance:	yes	yes	yes	no	yes
Flame Resistance: FAR 25.853: FMVSS: (SJ-3560, SJ-3540 and SJ-3550 Fasteners were tested for flame resistance after being adhered to thin metal panels).	(b-2) 302	(b) 302	(b-2) 302	(b-2) 302	(b-2) 302
Shelf Life:*	1 year	1 year	1 year	1 year	1 year
	*One year from date of receipt by customer when stored in original packaging at 70°F (21°C) and 50% R.H.				
Solvent Resistance: Splash testing cycle-20 seconds submersion-20 seconds air dry-3 cycles.	No apparent degradation of Dual Lock Industrial Fastener when exposed to splash testing with many common solvents, including gasoline, JP-4 jet fuel, mineral spirits, motor oil, ammonia cleaner, acetone, methyl ethyl ketone (MEK).				

Typical Performance Characteristics	Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.				
	SJ-3460	SJ-3560	SJ-3440	SJ-3540	SJ-3550
Dynamic Closure Performance					
Dynamic Tensile Disengagement: Lbs/sq. inch (kPa)	38 (262)	38 (262)	30 (207)	30 (207)	30 (207)
Each product was mated to itself with firm pressure, and disengaged at a rate of 12 inches (305 mm)/minute.					
Static Closure Performance					
Static Shear: Grams/sq. inch:					
Will hold listed weight at listed temperature for 10,000 minutes	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 1000 200°F (93°C) 500	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 1000 200°F (93°C) 500	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 1000 200°F (93°C) 500	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 500 - 500	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 1000 200°F (93°C) 500
Each product was attached to aluminum and stainless steel panels, then engaged to itself in Tensile or Shear modes. Tests were conducted at the temperatures and gram loadings listed.					

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Typical Performance Characteristics (continued)	Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.				
	SJ-3460	SJ-3560	SJ-3440	SJ-3540	SJ-3550
Static Adhesion Performance					
Static Shear: Grams/sq. inch:					
Will hold listed weight at listed temperature for 10,000 minutes	-20°F (-29°C) - 72°F (22°C) - 120°F (49°C) - 200°F (93°C) -	-20°F (-29°C) - 72°F (22°C) - 120°F (49°C) - 200°F (93°C) -	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 1000 200°F (93°C) 500	-20°F (-29°C) - 72°F (22°C) - 120°F (49°C) - 200°F (93°C) -	-20°F (-29°C) 1000 72°F (22°C) 1000 120°F (49°C) 500 - 500
Each product was adhered to aluminum and stainless steel panels, then engaged to itself in Tensile or Shear modes. Tests were conducted at the temperatures and gram loadings listed.					
Operating Temperature Ranges					
Intermittent, low:	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)
Intermittent, high:	200°F (93°C)	200°F (93°C)	200°F (93°C)	158°F (70°C)	200°F (93°C)
Continuous, low:	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)	-20°F (-29°C)
Continuous, high:	158°F (70°C)	158°F (70°C)	158°F (70°C)	120°F (49°C)	158°F (70°C)
Operating Humidity Ranges					
Relative Humidity:	0%-100%	0%-100%	0%-100%	0%-100%	0%-100%

For Long Term Static Load Applications

In static load applications, conditions such as temperature variation, jarring, vibration, etc. can affect long term performance. The user should design the amount of fastening area based on the specific conditions in the application. Four square inches of fastening area per pound of static load is suggested as a starting point for such evaluations.

Attachment Guide	This information is intended to assist the designer considering Dual Lock Industrial Fasteners. Actual product performance will depend on a variety of factors including the fastener selected, the conditions in which the fastener is applied, and the time and environmental conditions in which it is expected to perform. Because many of these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the Dual Lock Industrial Fasteners to determine whether it is fit for a particular purpose and suitable for user's method of application.				
	Pressure Sensitive Adhesive Attachment				
	Dual Lock Industrial Fasteners with a pressure sensitive adhesive system can be conveniently bonded to a wide variety of materials, including but not limited to the following:				
	SJ-3540	SJ-3550	SJ-3560	SJ-3540	SJ-3550
Bare Metals	✓	✓	✓		
Painted Metals	✓	✓	✓		
Fiberglass	✓	✓	✓		
Structural Composites	✓	✓	✓		
Glass	✓	✓	✓		
Sealed Wood	✓	-	-		
Powder Paint	✓	-	-		
Plastics:					
ABS		✓	✓	✓	✓
Acrylic		✓	✓	✓	✓
Polycarbonate		✓	✓	✓	✓
Polystyrene		✓	✓	✓	✓
Rigid Vinyl		✓	✓	✓	✓
Plasticized Vinyl		-	-	-	-
Polyethylene		✓	-	-	-
Polypropylene		✓	-	-	-
Powder Paint		✓	-	-	-

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Attachment Guide (continued) Note: When using SJ-3550 or SJ-3560 Fasteners on plasticized vinyl (flexible PVC), evaluate for plasticizer migration over time is recommended. Adhere the Dual Lock Fasteners to the vinyl and age for 7 days at 158°F (70°C) and inspect for signs of plasticizer migration.

To obtain optimum bond to any surface, apply above 68°F (20°C). All surfaces must be clean, dry, and free of oil, grease, dust etc. Remove protective liner and press firmly onto the substrate for full surface contact. Use of a roller to help ensure full contact of adhesive on substrate is recommended.

Adhesive bond strength increase with time, as the adhesive flows into the structure of the substrate. Handling strength is achieved immediately. At room temperature, approximately 50% of ultimate bond strength is achieved in the first 20 minutes, 90% after about 24 hours and 100% after about 72 hours.

Mechanical Attachment

SJ-3440 and SJ-3460 Dual Lock Industrial Fasteners are plainbacked products. They can be stapled in place or sewn to fabrics. They can also be ultrasonically welded to polypropylene plastic.

For Additional Information To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550. Address correspondence to: 3M Bonding Systems Division, 3M Center, Building 220-7E-01, St. Paul, MN 55144-1000. Our fax number is 651-733-9175. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-809-750-3000. In Mexico, phone: 6-728-2180.

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